

The implementation of a multi- stakeholder approach in urban logistics

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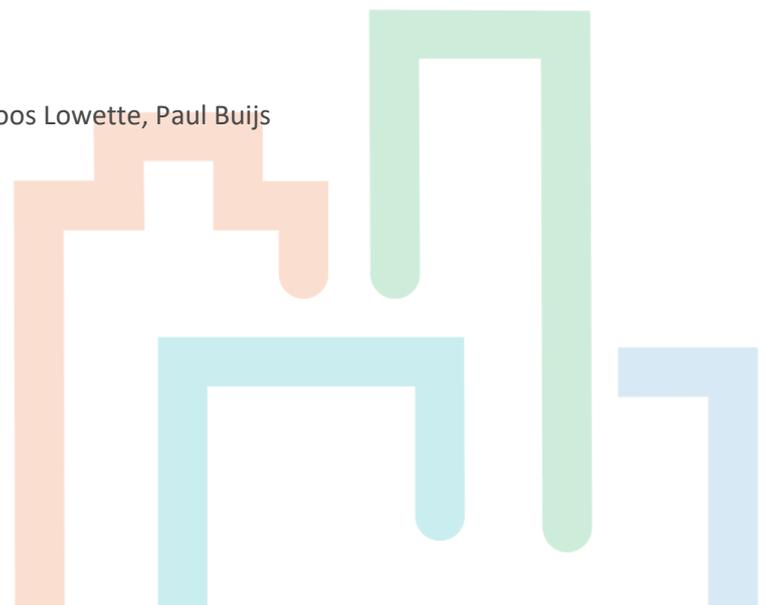
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Abstract

ULaADS sets out to offer a new approach to system innovation in urban logistics. Its vision is to develop sustainable and liveable cities through re-localisation of logistics activities and re-configuration of freight flows at different scales. Specifically, ULaADS will use a combination of innovative technological solutions (vehicles, equipment and infrastructure), new schemes for horizontal collaboration (driven by the sharing economy) and policy measures and interventions as catalysers of a systemic change in urban and peri-urban service infrastructure. This aims to support cities in the path of integrating sustainable and cooperative logistics systems into their sustainable urban mobility plans (SUMP). ULaADS will deliver a novel framework to support urban logistics planning aligning industry, market and government needs, following an intensive multi-stakeholder collaboration process. This will create favourable conditions for the private sector to adopt sustainable principles for urban logistics, while enhancing cities' adaptive capacity to respond to rapidly changing needs. The project findings will be translated into open decision support tools and guidelines.

A consortium led by three municipalities (pilot cities) committed to zero emissions city logistics (Bremen, Mechelen, Groningen) has joined forces with logistics stakeholders, both established and newcomers, as well as leading academic institutions in EU to accelerate the deployment of novel, feasible, shared and ZE solutions addressing major upcoming challenges generated by the rising on-demand economy in future urban logistics. Since large-scale replication and transferability of results is one of the cornerstones of the project, ULaADS also involves four satellite cities (Rome, Edinburgh, Alba Iulia and Bergen) which will also apply the novel toolkit created in ULaADS, as well as the overall project methodology to co-create additional ULaADS solutions relevant to their cities as well as outlines for potential research trials. ULaADS is a project part of ETP ALICE Liaison program.

Keywords

Multi-Stakeholder Approach, Stakeholder Mapping, Stakeholder Network, Local Fora, Collective Target System, Deductive Impact Assessment, Decision- Making

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Executive summary

ULaADS wants to shape the urban on demand logistic towards sustainable solutions, which will be tested in the lighthouse cities Bremen, Mechelen and Groningen. These solutions focus on containerised last-mile delivery, sharing economy platforms for on-demand city logistics, city-wide platform for integrated management of urban logistics, dual mobi-hubs and cargo hitching. In order to achieve sufficient long-term solutions, the support of various stakeholders is needed.

Solutions and decisions are generally more accepted by the affected companies and people - which will be referred to as stakeholders - if they are involved in the development of the solutions and decision-making processes. Furthermore, it is crucial for the sustainable long-time success of a solution to take the needs and requirements of stakeholders into account. Different approaches are possible depending on the extend of the participation process. Nonetheless each involvement process depends on a framework of preoperational and accompanying steps to achieve the aim of the process.

Deliverable 2.2 will introduce the multi-stakeholder approach as it is planned and was conducted/implemented in the ULaADS lighthouse cities Bremen, Groningen and Mechelen. The aim of this approach was to define the solutions and respective needs and requirements for the planned ULaADS Trials in a co-creation dialogue with relevant stakeholders. Therefore, the deliverable will give a perspective of the preoperational steps like the definition of the logistic ecosystem and stakeholders required for the success of the ULaADS trials. Furthermore, it includes the methodological approach and framework for the stakeholder engagement in the project which is adapted for each city regarding their trials and needs.

The overall multi-stakeholder process comprises a stakeholder mapping process, a series of local fora and related working groups, the collective target system approach, and further questionnaires. The local fora play a big role in the stakeholder involvement process. In total at least three local fora will be conducted in each city. The first one aims on the further definition of the trial in regard of the needs and requirements of the stakeholders and will be held before the trialling starts. After the first local fora common and conflicting goals will be evaluated using a collective target system. The second fora will be an intermediate and will be conducted during the trialling duration. This forum will offer the opportunity to reassess the trials and collect feedback about the trialling duration so far. The last local fora will take place at the end of the project and will identify lessons learned and deal with the outlook and opportunities on what will happen, when the project ends.

The method of the collective target system is following up the local for activities, giving insights into common and diverging objectives of the different stakeholder groups. As a follow up activity further open data questions will be answered via further stakeholder engagement or questionnaires. At the end of this deliverable, the approach of the deductive impact assessment will be introduced, showing how the results from the aforementioned steps will finally contribute to adapted and updated trials descriptions for the ULaADS use cases.

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1. Introduction

The growing need to consider sustainability for urban freight transport adds more complexity to the already very complex logistic processes in most cities. The complexity for decision making further demands for a decision support process which includes all aspects of the often complex decisions. In order to do so, continuously involving stakeholders is crucial. On the one hand stakeholder acceptance is vital for the cities logistics initiatives success and by including various groups of stakeholders a more complete overview can be obtained which strengthens decision-making by a factual basis and a reduction of uncertainties (Stringer et al., 2008, Russo et al., 2021). The involvement process should be integrated in the decision making as early as possible and representing stakeholders systematically. Therefore, a clear objective is needed (Reed, 2008).

The ULaaDS project will support the lighthouse cities Bremen, Mechelen and Groningen on their way to sustainable city logistics. In order to get the clear objectives for the stakeholder engagement, Work Package 4 defined with all cities a framework of the cities' logistic initiatives. Since all cities have a different baseline and general conditions, each city will have to face different challenges and extend of stakeholder engagement possible.

Therefore, each cities' baseline and logistics ecosystem needs to be evaluated in the preoperational phase of the stakeholder engagement. The evaluation and the framework for the different trials will set an objective for each stakeholder engagement process. In each city the stakeholder engagement will start before the trialling of the new urban logistics solution and shall help shaping them with the local inputs and needs from stakeholder groups from logistic service providers, public authority, academia, residents and consumers. According to these inputs the trials can be adapted to increase the acceptance of the new solutions among stakeholders. This stakeholder engagement will mainly consist of local fora which should enable discussions across stakeholder groups and promote discussions and understanding for different perspectives and obstacles.

In total, the stakeholder engagement process will comprise at least three local fora per city. One will be in advance, before the trialling starts. The second fora will be held during the trialling in order to get feedback and do adaptations if necessary and the last fora will take place at the end of the trialling in order to get feedback and discuss lessons learned. If required, further involvement will take place in form of working groups for example. Furthermore, feedback options will be installed through the trialling period and information from the decision-making process will be communicated comprehensibly.

1.1 The cities' objectives

1.1.1 Trials planned in Bremen

Bremen will focus on two trials:

The first ULaaS trial in Bremen will focus on expanding the number of micro hubs and cargo bike freight transport building on the forerunner project called Urban BRE which started 2019. Within this forerunner project, a micro hub was set up, from which cargo bikes from the ULaaS partner company Rytle do the last mile to the inner city. Within ULaaS, the focus is set to the transport of general cargo instead of courier express freight itself and expanding the number of micro hubs within the city. In the first local forum, Bremen wants to introduce the already achieved successes regarding cargo freight transport and the vision of the city of expanding this measure with the help of the ULaaS project to various stakeholders.

The first local forum will therefore be mainly an informative meeting with the option to consult and give feedback. The second local forum will deal with the expansion of the micro hubs and face the question of suitable locations. Furthermore, stakeholders from parcel delivery services shall be included in the project planning and convinced to use the service. Therefore, the second forum will aim for a more involved approach than the first one. The third local forum will have the aim of discussing further progress and lessons learned from the trialling itself. Overall, the local fora for the first trial in Bremen have the objective to promote the city's activities to a broader range of logistic stakeholders and engage them in participating. Additionally, the measure shall be further developed in such a manner that it will be suitable not only for general freight transport but also parcel delivery services.

The second trial will focus on private logistics. Within the ULaaS project and together with ADFC, Bremen will install 24/7 cargo bike sharing options of five cargo bikes. This measure can be implemented either together with already offered services or with the city's initiative of a comprehensive city driven cargo bike sharing network that was announced during the ULaaS project in June 2021. The city-wide sharing network shall consist of cargo bikes which will be offered for little monetary compensation. Therefore, the ULaaS solution will be a complementary measure for private micro logistics.

Within the second trial, a sub-trial will be conducted in Bremen together with Via Van, concerning combined person and freight transport which will be tested on an industrial site. This trial aims for the reduction of freight transport traffic within the industrial site by taking advantage of other passenger trips that take care simultaneously. Since little number of stakeholders are involved due to the nature of the trial and its location, the involvement process does not require a local forum but will be consisting of regular meetings and exchange with all the stakeholders involved.

1.1.2 Trials planned in Mechelen

In Mechelen, the city vision includes a Zero Emission Zone in the city centre by 2030. The trials performed in the ULaADS project will aim for solutions of business to business (B2B) deliveries. Bpost, Ecokeoeriers and UPS will trial innovative logistic solutions regarding a city-wide platform for integrated management of urban logistics. The three partners will participate in the first trial which aims for the bundling of resources for a zero-emission delivery ecosystem within the cities. Ecokeoeriers and UPS will do the last- and first-mile delivery by cargo bike to a micro hub within the city. They will optimize their routing by dividing the orders by size and place. Bpost will deliver the freight from the micro hubs to the city hub and lastly, from there, the further delivery will be done by Bpost or UPS, depending on the client's agreement.

The objective of the involvement process for this trial is to define conditions which will enable the service both from a provider and customer side. Therefore, active stakeholder involvement is aimed at directly working with stakeholders to understand the needs and requirements and adapt accordingly.

Each of the mentioned partners will focus on different aspects within the trial. On the one hand, Ecokeoeriers will additionally focus on a solution for reverse logistics. The objective of the stakeholder involvement process is to define settings for these operations and get insight about customers' needs and possible obstacles that need to be circumvented. Bpost on the other hand will furthermore trial a bundling of deliveries of various logistic service providers, which will deliver the freight to the city hub at the city boarder and Bpost will do the end delivery. The aim of the involvement process is to discuss conditions under which service providers will be accepting to use this bundling of freight streams. This trial will not only require stakeholder involvement but also collaboration in order to define the solution in such a manner, that as many logistic service providers will join as possible.

UPS will focus on implementing zero-emissive vehicles such as cargo-bikes for the inner-city deliveries and pickups.

The second trial in Mechelen will implement the use of an autonomous vehicle for parcel delivery. Starting with a theoretical approach, five scenarios were described and provided to a panel of experts and stakeholders. Their input and feedback on the proposed scenarios have been used to choose one scenario for effective trialling. The chosen scenario is a cargo-hitching scenario, where a parcel locker will be integrated in the autonomous vehicle for passenger transport. Bpost will be the partner, filling and picking up the parcels in the vehicle. A tender has been send out to define the constructor / provider of the vehicle. The vehicle will bring and pick up people and parcels on an industrial park, which is a public open road.

1.1.3 Trials planned in Groningen

Groningen has planned for two trials. The first trial aims for logistic solutions for shop owners within the inner city and will implement a crowdsourcing platform marketplace for city logistics. Groningen dedicated itself to reach zero emission city logistics by 2025. While this commitment should result in a more liveable city, local businesses may face additional challenges as a result of the shift to zero emission city logistics—on top of the already challenging environment with competing e-commerce channels. The city of Groningen wants to assist local businesses in this transition by involving them in the development and trialling of the ULaADS solutions. In this regard, two solutions have been discussed and will be trialled. First, Groningen will explore the use of a local pickup and delivery service—with hub. This solution should provide local businesses the option to let parcels for home delivery be picked up from their local store by cargobike and delivered to consumers. This service should include home deliveries in Groningen (by cargobike) and beyond (via subcontracting), be open for multiple local cargobike operators, and have different delivery speeds (same-day, next-day, multi-day delivery). Second, a solution with shared zero-emission vehicles will be implemented and tested. The fleet of vehicles includes different vehicle types (i.e., cargobike, trike, van) and placed at different locations. These decisions are based the needs of local businesses looking forward to how the situation will be when the zero emission zone will become effective. In order to achieve solutions which will work for the different needs and requirements of shop owners, Groningen sets on a collaborative approach with the aim to develop solutions together with stakeholders and the Groningen City Club, who will be leading the trial.

The second trial that will be conducted in the suburban area deals with shared logistics on a park and ride site. At this site, a parcel locker will be implemented, which can be used by commuters to avoid additional traffic due to additional trips. The parcel locker is owned by the public body, and can be used by every logistics provider, shop owner or commuter. Furthermore shall be tested whether and how local entrepreneurs can benefit from the use of the parcel locker. Groningen will also investigate if the public transport (buses going from the park & ride to the inner city and back) can interact with the locker system for cargo-hitching, yet this will not be tested in real life.

1.2 Relation with other work packages

The work described in this deliverable was mainly conducted within Work Package 2 “360° observatory of on-demand mobility needs & future scenarios”. The relevant tasks within this WP are the Task 2.2 “Ecosystem perception and local stakeholder engagement: local urban freight fora” and the Task 2.3 “Stakeholders’ needs and requirements for ULaADS use cases”. Apart from obvious connections between these two tasks and the other tasks within this WP2, the results about the stakeholders’ needs and requirements are also important for ULaADS’ Research Trials (WP4), as the results will be processed and used to define and update the trials planned. The activities are also closely connected to the Impact & upscaling assessment in WP 5, especially the data collection which will also be linked with WP6’s objectives. The outcomes of the multi-stakeholder process of WP 2 will also influence the work in WP6 “The role of ULaADS in the existing SUMP and Sulp process”.

2. Methodology

Identifying the needs & requirements of the stakeholders involved in the ULaADS trials and assessing the impacts on the actual plans of implementation is one of the key challenges of the project. In this chapter, the most important methodologies used in the ULaADS multi-stakeholder process will be introduced. In short, we are talking about:

- The identification of relevant local stakeholders via stakeholder mapping (see 2.1)
- The introduction of a collective target system to elaborate common and diverging aims and objectives (see 2.2)
- The establishment of a co-creation dialogue via local fora (see 2.3).

2.1 Stakeholder mapping

As a starting point and to gain knowledge and understanding of the local logistic ecosystem within the three lighthouse cities (Bremen, Groningen and Mechelen) the responsible partners of the consortium had to appropriately identify, describe and - at a later point - involve the specific stakeholder groups prevalent in each of these cities. To fulfil this, a stakeholder mapping process was conducted.

2.1.1 Setting up the stakeholder mapping

As a preparation for the stakeholder mapping, a template table was elaborated by the partners FGM and RUG, including the measures and approaches proposed in the DG Move non-binding guidance document on urban logistics N°3/6 by Van den Bossche et al. (2017) and sent out to the lighthouse cities (BRE, MEC, GRO) with the request to fill their local stakeholder network contacts into this table, based on their subjective estimations and experiences. In most cases the answers had to be chosen from a dropdown menu to allow easier processing of the information and data.

Within this table it was the task of each city to fill in 13 columns with attributes per stakeholder, including information about:

Table 1: Information per stakeholder in the stakeholder mapping process

- | | |
|---|---|
| <ul style="list-style-type: none"> • Stakeholder type • City the stakeholder will be active in • Keyword for their activities (e.g. Frontrunner or Follower ...) • Involvement history • Research Trial the stakeholder will be part of/participating in (inner city and urban/peri-urban area) | <ul style="list-style-type: none"> • Importance for ULaADS • Influence on other stakeholders • Expected main contribution + further information • Expertise + further expertise • Stakeholder legitimacy • Stakeholder's interest |
|---|---|

The lighthouse cities filled in the table in three rounds before the local fora. One in December 2020 followed by updates in July and November 2021. Since the project naturally evolves, the necessary stakeholders might change as well. As a result, a stakeholder mapping should always be seen as a living process.

In order to evaluate the stakeholders who shall be involved in the local fora for the respective city, an adapted version of the Interest Power Grid of Mendelow, A.L. (1981) was implemented. The latter gives insight about how to manage stakeholders with respect to their estimated power and interest. Data about the stakeholders was filled in by the cities themselves. Since we asked for the nature of interest instead of a quantitative assessment in form of a Likert scale, Mendelow's interest power grid was adapted in that way that all interests have an equal value except the interest of simply being informed. In other words, the adapted version of the method focuses on a qualitative statement of the interest and a quantitative statement regarding the power. Figure 1 shows the difference between Mendelow's interest power grid and the adapted version used for ULaADS.

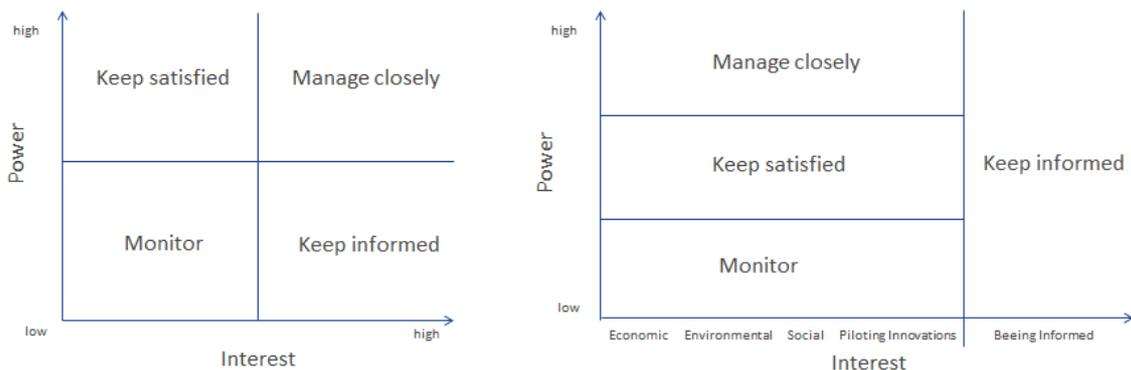


Figure 1: Left: interest power grid from Mendelow A.L. (1981); right: adapted interest, power grid with qualitative statements of the interests

The overall power for ULaADS was calculated according to the weights in Table 2. Since the stakeholder mapping is a subjective approximation which only serves for internal estimation needs, the weights were elaborated in internal discussions. Importance and influence for ULaADS, the stakeholder's legitimacy, the influence on other stakeholders as well as the keyword were taken into account according to a certain ratio.

Table 2: Attributes used for the calculation of the overall power of stakeholders for ULaDS with the respective weights

Attribute	Weight for the calculation of the overall power
Importance and Influence for ULaDS	0.35
Legitimacy	0.3
Influence on other stakeholders	0.15
Key attribute	0.2

For each of those attributes there were different answer options, which can be seen in Table 3. For this, we defined n (see Table 3), which reflects the maximum points that can be reached per estimated answer. For the calculation of the overall power of a stakeholder for ULaDS we then used n to avoid disproportionate ratios.

$$Power = \frac{Importance}{n_{importance}} + \frac{Influence}{n_{influence}} + \frac{Legetimacy}{n_{legitimacy}} + \frac{Keyword}{n_{keyword}}$$

Table 3: Answering options and their respective rating for the attributes used for the power calculation

<i>n</i>		Answer options					
Importance for ULaADS	2	Very important	Moderate important	Not important			
		2	1	0			
Influence on other Stakeholders	2	High influence	Moderate influence	No influence			
		2	1	0			
Legitimacy	6	Expertise and directly involved in research trial	Expertise and directly affected by research trial	Expertise and indirectly affected by research trial	No expertise and directly affected	No expertise and indirectly affected	Expertise and not affected by research trial
		6	5	4	3	2	1
Keyword/ Attribute	2	frontrunner	representative	follower	newcomer	interested	
		2	1	0	1	0	

Therefore, the power for each stakeholder is between 0-1 being it 1 the maximum possible power assigned to a stakeholder. This leads to the further differentiation between the stakeholders. Stakeholders with an interest but being informed with a power of 0-0.3 should be monitored, stakeholders from 0.3 – 0.6 shall be kept satisfied and all stakeholders above should be closely managed.

The stakeholder mapping is mainly a tool for internal evaluation, which helps to manage the awareness about the existing stakeholders. By carefully going through the results, it will be possible to carefully select the right stakeholders for the planned trials to increase the potential for a successful implementation of the trials. Since this mapping is of dynamic nature it was conducted firstly to prepare for the planning process and will be repeated in-between each local fora.

2.2 Collective Target System

The Collective Target System (CTS) is a tool to evaluate common and conflicting goals and use it as a tool of decision-making so that acceptance within the stakeholders increases. This tool occurred in literature for the first time by Russo et. al (2021). In a nutshell, this method is asking different stakeholder groups questions in three categories.

Figure 2: Schematic display of the condensed group results [%] from the collective target system

	Strongly agree			Slightly agree			Neutral			Slightly disagree			Strongly disagree		
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
Social Goals															
Goal 1															
Goal 2															
... Goal n															
Environmental Goals															
Goal 1															
Goal 2															
... Goal n															
Economic Goals															
Goal 1															
Goal 2															
... Goal n															

The questions have been set through literature study and were answered using 5 point Likert scale. The results were compared per stakeholder group. Finally, the use of a Kruskal Wallis test, a statistical test uses ranks in one-criterion variance analysis to detect diverging goals, highlighting objectives that may need further discussion between the stakeholders.

For ULaADS, it is planned to use and partly adapt the CTS methodology as described here:

The stakeholders will be allocated to one of three stakeholder groups. The categories will be slightly adapted into the three pillars of sustainability: social, environmental and economic sustainability. For the goals that shall be answered with the Likert scale there will be generic questions and further questions tailored for the actual trials in the cities. THE CTS will be used after the first round of Local fora.

2.3 Stakeholder engagement process

As previously presented, within the ULaADS project, it is planned that each lighthouse city will conduct at least three local fora initiating a multi-stakeholder process and establishing a co-creation dialogue between all the parties involved in the trialling of the ULaADS solutions.

The first round of local fora will be conducted, in each city, before the effective trial implementation phase starts in order to gather information about the needs and requirements of affected stakeholders which will be followed by further steps of assessment and discussion to define their impact on the trials planned.

The second local forum will be conducted after the first six months of actual trialling. These fora's objective is to get feedback from the stakeholders involved in the trials and evaluate possible improvements for the trials and to inform stakeholders about the status quo and experiences made so far. Since the content of these intermediate fora depends on the developments, the fora will be planned after the trialling started.

The third local fora are planned at the end of the trial phase and will identify lessons learned from a stakeholder point of view and will deal with the outlook and opportunities on how to continue with the trials when the project ends.

It has been stated and seen throughout the project development that in some ULaADS trials the number of stakeholders involved is not as big as expected, primarily due to the fact that the implementation will take place in a limited test surrounding. In these cases, more specified workshops will substitute the local fora.

2.3.1 Approach to the 1st round of local fora

The approach for the first round of local fora as described in this chapter can be seen as baseline or blueprint for orientation. Then, each city adapts the approach due to different objectives and stakeholders.

The proposed length of the local fora is between three and four hours and the proposed structure divides the forum into 4 sections. It starts with the opening which consists of a welcome and the introduction of the ULaADS project, followed by a theoretical input about expected future trends and scenarios as well as the vision of the city. Then the first participatory part starts where general chances, needs and requirements for the future shall be elaborated. The results of this part will on the one hand deliver input for the assessment of the ULaADS trials and give the cities insight about what concerns stakeholders and where future work can focus towards.

This rather general group work is followed by the presentation of the trials, which in the best case will tackle some of the obstacles elaborated in the first group work. Subsequently a second group work follows with the aim to discuss needs and gather feedback on the trials and operational steps themselves.

The last block is built on an introduction of the next steps like the Collective Target System as well as feedback options.

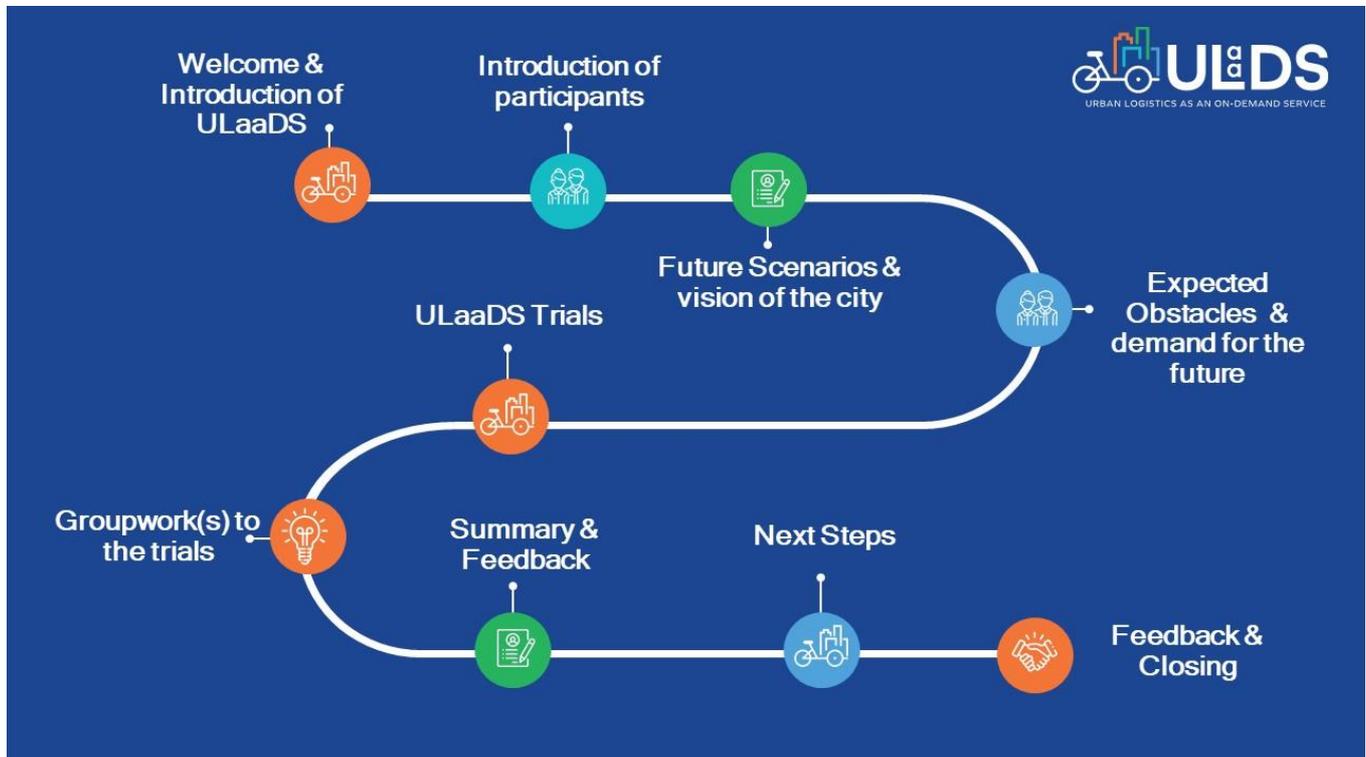


Figure 3: General proposed format of the first local fora for the lighthouse cities in the ULaaDS project

2.3.2 Data collection

Collecting data to prepare the trials is another vital part of the preparation phase. It is closely connected to the multi-stakeholder process, as the data needed normally can be retrieved by the stakeholders involved in the ULaaDS trials. It is crucial to gain functional information like vehicle properties, delivery frequencies, order organisation, timeframes for deliveries e.g. as well as social aspects to optimise the plans for the ULaaDS trials. Especially for qualitative data it may be suitable to be collected within the participation process. This includes non-measurable data like the awareness of sustainable solutions as well as the willingness to pay for sustainable deliveries. Basically, there are different ways foreseen to collect the data: Firstly, and if possible, data shall be collected during the local forum. As time is sparse within the local forum, another option would be to ask the stakeholders for their data contribution in follow up workshops and bilateral communication. Last but not least, questionnaires will be conducted in the beginning of 2022 to fill in the gaps in the data needed.

3. First results: the local ecosystems & identification of relevant stakeholders

3.1 Existing urban logistics networks in the ULaaDS lighthouse cities

The results of the stakeholder mapping process allowed to elaborate information about existing urban logistics networks in each lighthouse city. For each of these cities the logistic network relevant for ULaaDS has been visualized and can be seen in the Figures 4 – 6 on the following pages.

The cities of Groningen and Mechelen have a long history in building a network of various logistic stakeholders within the city. Both cities have a strong focus on shaping the city using a story telling approach, introducing their vision of the city's future to the different stakeholders. Groningen decided already in 2014 that by 2025 the city logistics will be zero emission. In 2017 they started to install focus groups for sustainable logistics and in 2018 a local convent for sustainable logistics was signed by logistic stakeholders. Since 2021 a SULP is established by the city council. The ULaaDS trials are embedded within this vision and shall support the finding of solutions for retailers in the inner city. Since the city is engaging with stakeholders for the past years it is feasible that already a strong network is implemented which supports the implementation of a co-creation dialog and the solutions in general.

Mechelen has applied a similar approach. The city invested within the last 5-6 years' resources in stakeholder engagement which ultimately led to a city convent with 29 signatures from logistic companies, interest organisations and retailers. During this process a zero- emission working group was formed which meets twice a year to work towards the goal of a zero-emission city by 2030.

Bremen, on the other hand, does not have such a long history in the involvement of the logistics operators and therefore the network is currently developing. However, the trial affected by this can build on a previous work relation with stakeholders in the project Urban-BRE. Since the network is rather young, additional work will be needed in order to gain trust for the further cooperation of stakeholders regarding the ULaaDS trials.



Figure 4: Logistic network as a basis for ULaaS trials in Groningen, with frequencies of contact (w – week, m- month and a – year)

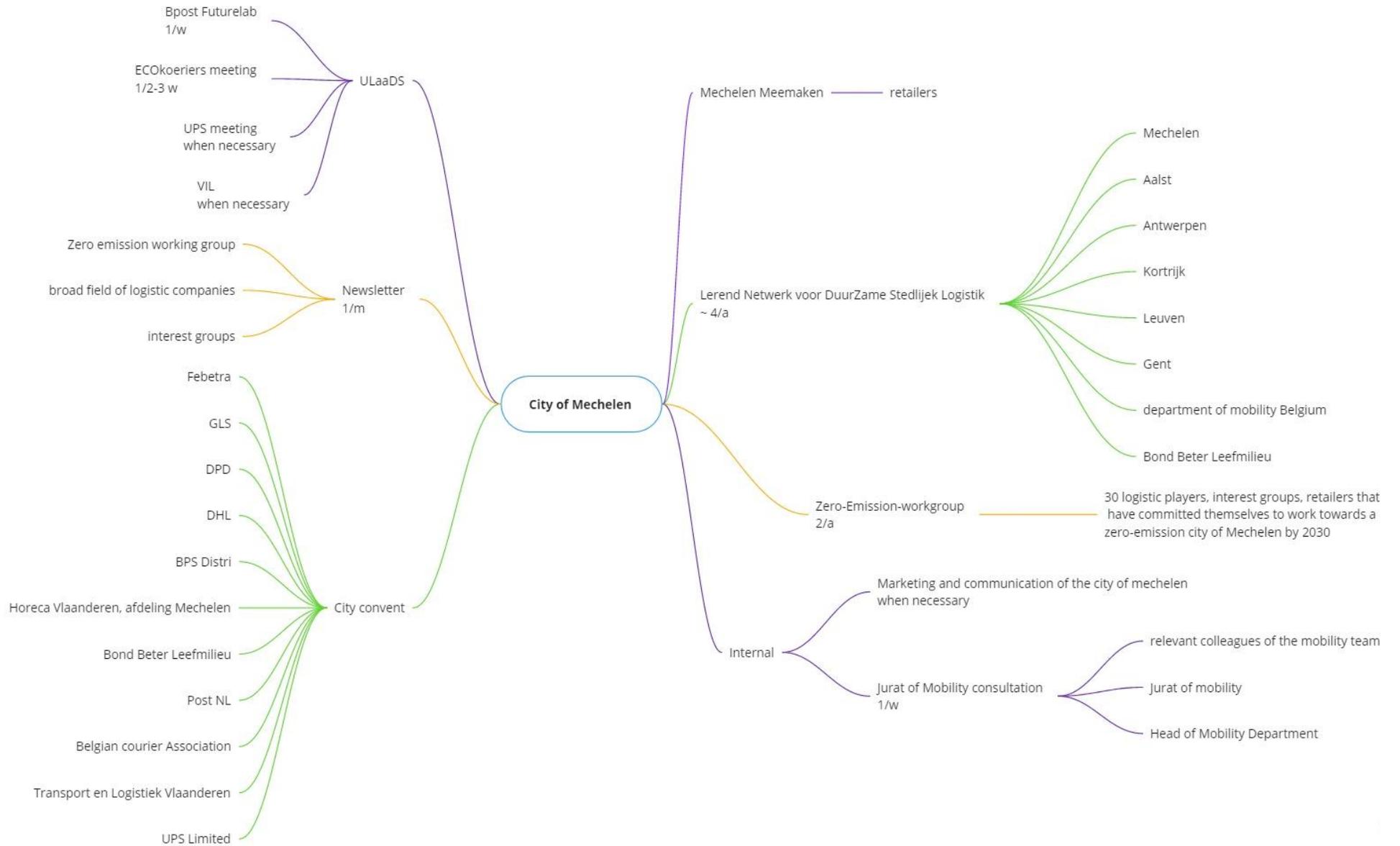


Figure 5: Logistic network as a basis for ULaaDS trials in Mechelen, with frequencies of contact (w – week, m- month and a – year)

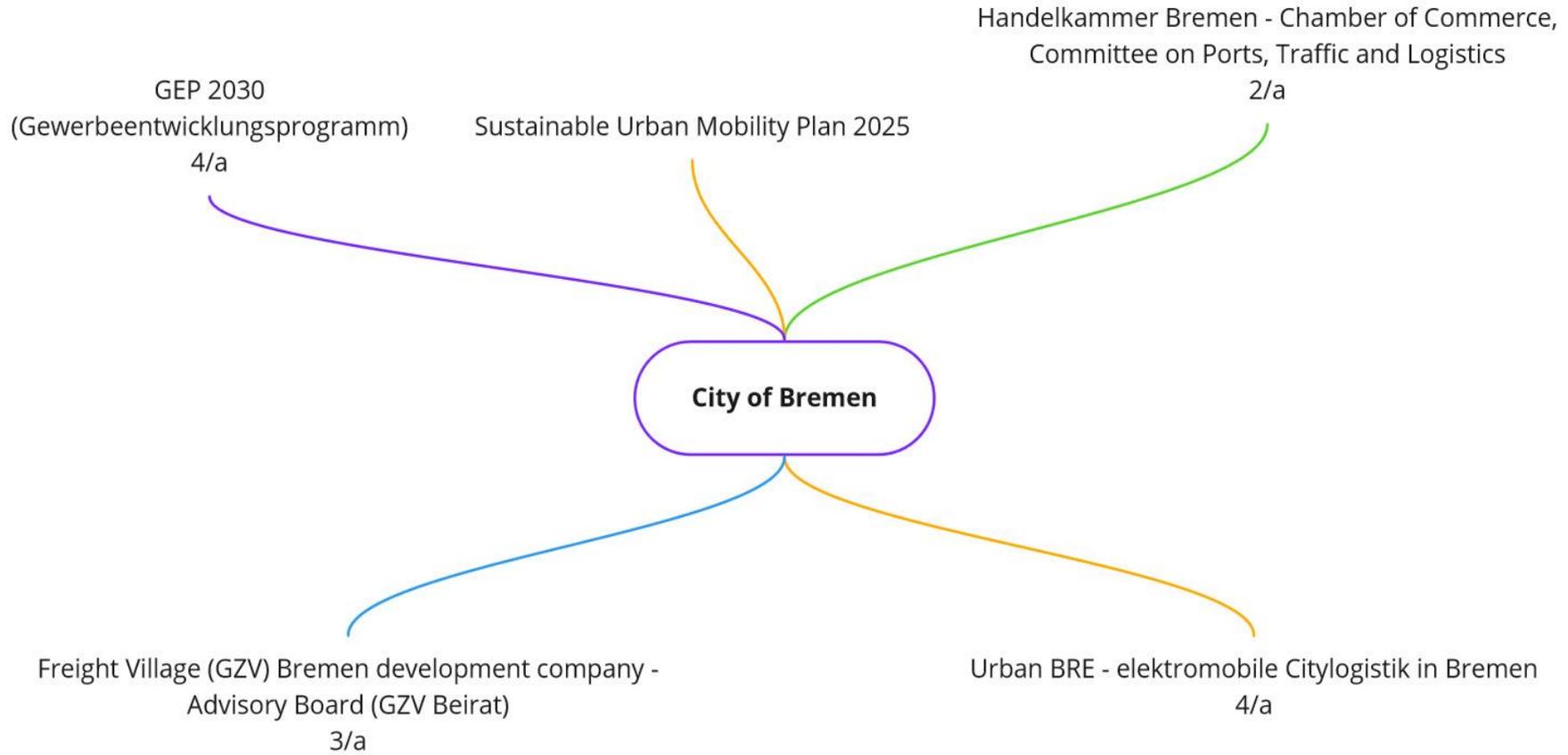


Figure 6: Logistic network as a basis for ULaDS trials in Bremen, with frequencies of contact (w – week, m- month and a – year)

3.2 Relevant stakeholders for ULaADS use cases

In ULaADS, a big part of the project is dedicated to the implementation of 2 or 3 Research Trials per lighthouse city, typically one located in the inner city, and one located in a (peri-)urban area of each city. Due to the great amount of stakeholders mentioned to consider and the fact that the consortium has to start a co-creation dialogue based on the results of the stakeholder mapping in WP2, each city was informed and advised on a bilateral basis about recommended further handling of stakeholders and if it would be feasible to include further stakeholders from varying stakeholder groups. Depending on the results of this process and the regarding objectives of the engagement processes, the consortium is/was also able to decide on how to implement the local fora in the upcoming **Subtask 2.2.2 Establish Co-Creation dialog and data collection**.

First of all, it can be distinguished between stakeholders which are directly affected from or involved in the ULaADS trial from those who are not directly related. On the one hand we do have project partners which are responsible for the implementation, however, on the other hand we have external stakeholders who are important for the successful implementation and long-term success of the project such as consumers. Furthermore, the stakeholder process requires input from stakeholders which are not directly affected by or involved in the ULaADS trials but non the less are still important for their expertise. This stakeholder group would for instance include researchers and academia.

In order to achieve a diverse stakeholder composition, the stakeholder ratio shown in Table 4 was set as aim for the local fora. This ratio was previously proposed for stakeholder engagement by the [NOVELOG Guidelines for the Planning and Development of SULPs](#).

Table 4: proposed ratio of stakeholders for the engagement process based on the Novelog guidelines for planning and development of SULPs

Group Number	Group Name	Stakeholder [incl. subgroups]	Expected percentage within the local fora
Group 1	Supply chain stakeholders	G1.1 Shippers, Transport Operators, Shippers and Receivers	Up to 28%
		G1.2 Shopkeepers, Offices, Residents	
Group 2	Public authorities and Other Stakeholders	G2.1 Public Authorities	Up to 28%
		G2.2 Associations, Researchers and Academia	Up to 36%

Group 3	Experts	G3.1 Experts, city residents, users, vehicle and IT providers, etc.	Up to 8%
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From a practical point of view, a stakeholder engagement process does always depend on resources not only from the city's side but also from the side of stakeholders who shall engage with the project. It is hard to keep in balance the advantages for stakeholders participating and the effort on time and monetary basis that stakeholders have to invest. Especially some stakeholders from big companies e.g. often lack time or willingness to cooperate in a long and expensive engagement process. This leads as an example for the difficulties that can for appear in real life realization of an engagement processes.

In some fora it might also not be reasonable to have the ratio proposed by the NOVELOG guideline due to the fact that some stakeholders need more attention and a closer cooperation than others, which can rather be achieved by a series of smaller workgroup meetings.

A good example for that are the two trials which will take place in the peripheral area of Bremen and Mechelen, only a small number of stakeholders has to be involved. In the cargo-hitching trial in Bremen, mainly the partner for implementation and the business on which area the vehicle cargo-hitching will be tested are the main stakeholders next to the city, that even plays a minor role in this case.

In Mechelen the autonomous vehicle with integrated parcel locker will be tested at a business site as well. As a result, also here the stakeholder list is manageable even though the number exceeds the one for the trial in Bremen. For both, dedicated stakeholder fora might not be the best way of involvement, since the main stakeholders are big companies which can be easier managed with shorter but more frequent meetings and feedback loops.

Fehler! Verweisquelle konnte nicht gefunden werden.5 shows the ration of the stakeholder groups f or each city and trial. Due to the different approach in the trials regarding the trial cargo-hitching in Bremen and the AV in Mechelen, those two trials have not been included. Furthermore, the trial in Mechelen with UPS only is not included due to a delay in progress. The trial in Mechelen with ECOkouriers will only be dealt with in the fora for the joint trial in Mechelen regarding shared resources with Bpost, ECOkouriers and UPS and is therefore not explicitly mentioned either.

Table 5: stakeholder group percentage, 3rd round of stakeholder mapping for the trials in the cities

	Mechelen			Groningen		Bremen	
	Proposed %	Joint trial	VIL	Inner city	P&R site	Micro-hub logistics	Cargo bike sharing
G1	28	17		59	62	57	0
G2.1	28	42		19	15	17	55

G2.2	36	38		22	24	20	45
G3.1	8	4		0	0	7	0

In general, a lot of trials have a surplus of stakeholders in the stakeholder group 1: logistic service suppliers and supply chain. This can be explained on the one hand with the allocation of shop owners to this stakeholder group, from which some will have further representative functions. Some also can be accounted to the group experts. The line of stakeholders or consumer allocated to the stakeholder group 1 and experts is not always clear and stakeholders sometimes cannot be assigned to one group exclusively.

For the trial in Mechelen in the inner city, crucial stakeholders are the partners Bpost, Ecokeoeriers UPS and the shop owners, since the trial will focus on B2B delivery mainly. Other stakeholders from the stakeholder group "supply chain", like logistic service providers, will be consulted in form of shorter meetings. This shall decrease any barriers concerning time and financial aspect of participation. It shall increase the willingness to join the meetings and give insights in the needs, priorities and challenges regarding the engagement of big companies in the strongly competitive parcel delivery market. This stakeholder group is also the customer group and therefore critical for the success of the trial. As a result, their needs are vital to consider, and the stakeholders have to be managed closely.

The same can be said regarding the trial for the inner city of Groningen. Though not only shop owners but also respective representative organisations are, due to their influence and expertise, recommended to be managed closely. Shop owners do belong to the stakeholder group G1 since they are part of the logistic supply chain. The difference in the percentage of stakeholders assigned to this group for the joint trial with UPS, Bpost and Ecokeoeriers in Mechelen and the trial in Groningen for the inner city can be explained by the fact that Mechelen did not yet include a specific number of shop owners. Mechelen is currently advertising the trial among the shop owners and is still waiting for response. On the other hand, Groningen has, due to the GroningenCityClub (a representative organisation of the shop owners from the inner city), already further progressed and listed specific shop owners who commit to participate.

Those shop owners will additionally participate in the local fora for the peripheral trial regarding shared logistics. This stakeholder group is important for the second trial, since the parcel lockers shall offer new possibilities for deliveries to the local shop owners and they are therefor also a crucial stakeholder group. Not only local shop owners can be possible customers but also e-commerce companies shall participate. Since the big number of businesses the ratio for the stakeholders is shifted towards the stakeholder group G1. Since the first forum will be mainly informative and consultative this is feasible.

For the micro-hub logistics trial in Bremen, the city can build upon an already well-rehearsed network of stakeholders due to the project Urban-BRE. For the trial again there is a surplus in the stakeholder group G1: Logistic service providers, however, the objective of the first local forum is rather informative and it is therefore feasible to focus on logistic service providers' participation.

4. Adapted Local Fora

Due to differences in the local settings and framework conditions, the approach of the local fora have to be adapted to each city's need. Since the trial preparation and respectively the framework for the trials do evolve dynamically the stakeholder mapping is also a continuous process with regular adaptations. Due the dynamic nature of the baseline conditions for the engagement process the adaptations of the local fora structures occur in dependency of the framework, preparation progress and respective stakeholders. The table below shows the status quo of all trials at the time of deliverable submission and whether local fora will be the main part of the stakeholder engagement.

Table 6: Overview of the trials conducted in ULaDS

City	Scheme	Area	Implementing Partners	Trial	Local fora
Bremen	Micro-hub-logistics	Inner city	Rytle	Trial 1 Bremen	✓
	Cargo-bike sharing	Inner city	ADFC	Trial 2 Bremen	✓
	Cargo-Hitching	Peripheral area	Via	Trial 2 Bremen	
Mechelen	City-wide logistic platform	Inner city	Bpost, ECOkoeriers, UPS	Joint trial Mechelen	✓
	Transport vehicle capacity sharing	Peripheral area	VIL	Trial VIL	✓
Groningen	Crowd-sourced logistic platform	Inner city	GCC	Trial 1 Groningen	✓
	Shared logistics on a P&R site	Peripheral area	OV-Bureau	Trial 2 Groningen	✓

4.1 Bremen

In Bremen in total there are three trials and two stakeholder engagement processes.

The trial with Rytle concerning micro-hub logistics started already with a framework due to predecessor project. Since the trial shall evolve during the ULaADS project the first meeting is feasible for an introduction of the current status quo and operational information. It will last for approximately two hours in order to increase willingness to participate from the stakeholders' side. The forum will be of informative nature with the aim to prepare following cooperation with other logistic players. The first block of the forum will focus on a welcome of all participants, an introduction of the ULaADS project and its aim as well as of the future scenarios and vision of the city Bremen. Afterwards, the current status quo of the micro logistic implementation established in the project Urban-BRE and its transition to the ULaADS trial will be explained to open up the possibility for questions and discussions. This will be followed by some feedback to the stakeholders about the first round of Delphi study Urban logistics, which was also conducted in the ULaADS project (Plazier an Rauws, 2021). Following that, active work regarding the trial will give insight about potential needs for adaptations and can counteract concerns. In a wrap-up phase, the next steps will be discussed, and feedback options will be provided.

For the engagement process related to the trial with ADFC and the cargo bike sharing for private logistics the details of the objectives are not clear yet and therefore the final planning of the local forum cannot be done yet. Nonetheless it is clear that any engagement needs to be done online due to the current pandemic situation.

In the cargo hitching trial planned with VIA only a few stakeholders will be involved and affected, and as a result the stakeholder engagement will be reduced to regular coordination meetings rather than local fora like in the other trials with ADFC and Rytle.

4.2 Mechelen

In Mechelen in total two engagement processes regarding the trials will take place. One engagement process is focusing on the trial for the inner city and the implementation that ECOkoeriers, Bpost and UPS want to trial separately. The other engagement process is regarding the VIL implementation that will be trialed in the peripheral area.

The first engagement process includes on the one hand the trial all three partners are involved and that is about bundling resources in urban deliveries, which will be called "combined trial" for reasons of simplification, and the trial which will be led by ECOkoeriers, on reverse logistics. Within this trial mainly shop owners from the inner city will participate, which are the customer group of both trials dealt with.

The engagement process was started by a preparatory meeting concerning the solution Bpost wants to trial separately. This solution has the difficulty of combining the interest of as many logistic service

providers as possible. Since this business is highly competitive, it is likely that there is a need to combine diverging interests.

To increase the number of stakeholders participating in the meetings, the duration was reduced to two hours. After a short welcome and arriving a presentation introducing the logistic situation in Mechelen, the ULaADS project and the proposed solution by Bpost was done. Then an open discussion with all stakeholders should give insight and feedback about possible barriers, needs and requirements.

Due to the current pandemic situation the forum will be held online and kept to about one and a half to two hours. The first local forum will start with a welcome followed by an information round on the ULaADS project and the combined trial. Following, a first feedback question round as well as questions regarding concerns, needs and the current status quo will be conducted. The answers will later serve as inputs for an open discussion about the logistic solution planned. The forum will end with a wrap up and outcast for the following procedures. This forum will rather have a consultative approach.

4.3 Groningen

In the City of Groningen a stakeholder engagement process is planned for each of the city's trials. For the trial in the inner city, Groningen wants to set on a collaborative approach. Advantage of such an approach is the high acceptance among stakeholders, since they are actively shaping the solution implemented later on. As such an approach needs significantly more time, only one local forum before the trial phase did not seem sufficient. Instead, the following approach took place: the need to find solutions for the business related logistic in the inner city was pitched to the shop owners with the help of the Groningen City Club. An emphasis was laid on the urgency and the opportunity to actively shape solutions that will fulfil their needs.

The response to this opportunity was well by the shop owners. In a first meeting the ULaADS project as well as the vision of the city for the future were introduced. This led to an open discussion about the obstacles that shop owners are concerned about. This first meeting and all following meetings were set to a duration of two hours.

With the inputs collected from the first meeting, an interview guide was prepared with the aim to analyse the logistic profiles and prepare for the next meeting. In total 20 interviews with shop owners were conducted to gain further and more detailed insights. The results of the interviews were presented in a second meeting where the specifications of the ULaADS trials solutions were elaborated. To elaborate solutions for various diverging needs, three working groups were built, which focus each on different solution specifications for the trial. For the input for the working groups' wishes and demands of the shop owners were discussed subsequently in this meeting.

With the inputs gained from the second meeting the needs were structured and narrowed down to possible solutions/trials by the working groups. Three thematic alignments were found. One group each will deal with solutions directed towards sharing platform of zero-emission vehicles, a city hub

with delivery service and other solutions for shop owners for whom the previous mentioned solutions do not work.

For the third meeting the topics locations, vehicles, providers, services and other stakeholders were prepared so that in the third meeting with also included other stakeholders like providers of logistic services the trials can be concretized and work appointments can be scheduled. With this meeting, solutions have been formulated with the collaboration of those stakeholders involved. As post processing steps offers of logistic service providers will be discussed. Furthermore, for the solution concerning the sharing platform IT education has to be prepared in order to avoid complications for shop owners. The locations for vehicles have to be fixed as well including thoughts about infrastructure.

The trial regarding the shared logistics on a park and ride site the engagement process will have rather informative nature. Nonetheless it shall be investigated whether to locker gains advantages for local shop owners as well. Therefor the local fora shall also give some feedback from shop owners from the inner city and representatives of e-commerce. The forum structure will be oriented on the general proposed approach of the first local fora with detailed adaptation still in the progress. This forum will have a slight delay since the locker shall already be implemented before conducting the forum. By the implementation of the parcel locker some difficulties appeared which resulted in a delay of the schedule for the local forum.

5. Outcomes and Adaptations for the ULaaDS trials

Based on the results of the multi-stakeholder process, the Task 2.3 “Stakeholders’ needs and requirements for ULaaDS use cases” will elaborate adaptations and optimisations for the ULaaDS trials. Therefore, a qualitative approach was developed, called **deductive impact assessment** (see figure 7.). Within this iterative process, all the inputs from the stakeholders, their needs, requirements and priorities will be split into functional and further implications (see steps 1 and 2 below). The influence of these implications will be compared to the original use cases planned within ULaaDS (3). If further information is needed, further consolidation of the stakeholders will take place e.g. meetings or questionnaires. In step (4), the fusion, the information gathered in the local fora, their correlated implications, the original plans for the use cases and the knowledge from other steps of the project will be combined to finally allow the adaptation of the ULaaDS-Trials. Due to unforeseen happenings in the project and the necessary adaptive steps in the preparation phase, this process is some weeks on delay. The results from the deductive impact assessments are awaited to be complete at the end of March 2022.

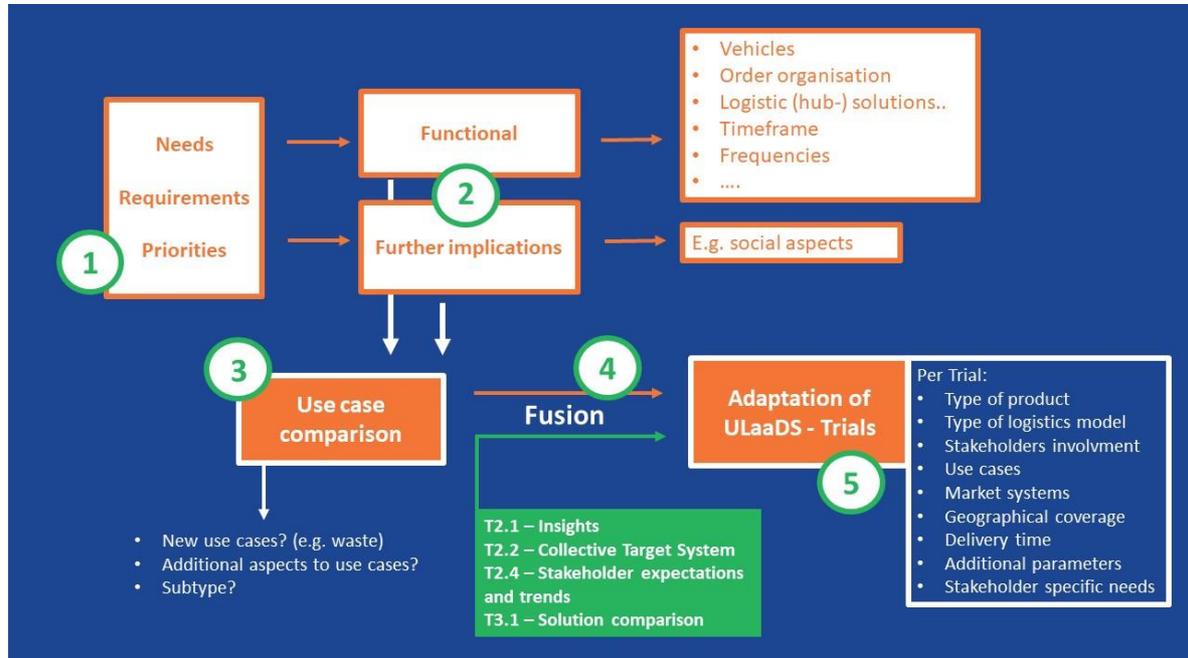


Figure 6: Scheme of the deductive impact assessment

6. Resume and further progress

Overall, all cities put a lot of effort in preparing a future zero emission city logistics. The ULaADS trials will support this transition in the cities. In ULaADS, the involvement of all relevant stakeholders via a multi-stakeholder approach is the key to successful long-term implementations for sustainable urban logistics. This is recognised by all lighthouse cities and therefore all cities put a great commitment in elaborating suitable solutions with the help of the local fora. For this purpose, a variety of methods were elaborated and will be applied to collaboratively develop solutions for complex city logistic settings.

A profound stakeholder mapping process at the beginning of any participatory process clearly gives the chances to choose the right stakeholders for any follow up-process. The power-level-assessment is a helpful step in this process. The approach of focussing on local fora proofs to be generally important and viable, but it also showed that in reality adaptations may be useful or necessary to achieve the best output for the trial preparation.

Due to complications like the insolvencies of two partners, which were on the one hand crucial for the implementation or the planning of the engagement process there is a delay with the trial preparation and therefore the framework. All engagement processes show a delay, even though the cities put significantly effort in preparing and promoting the trials. Within two stakeholder engagement processes local fora have already been conducted. This includes the engagement process for the trial for the inner city of Groningen and the respective solution which will be implemented solely by Bpost in Mechelen.

As a summary, a generalized approach abroad the cities has boundaries due to different baselines and needs. The approach to choose also strongly depends on the objective of the engagement process. Therefore, all engagement processes diverge from the general proposed structure to some extent. It is important to keep in mind the expectations of stakeholders and find a balance requested time by the cities for engagement and the willingness of stakeholders to invest time. Furthermore, the general proposed stakeholder ratio often reaches its limit in real life implementation. This is not only due to the diverging willingness to participate but also due to the further attention a certain stakeholder group sometimes requires, depending strongly on the objective of the trial and engagement process. As a result to these practical implications, the proposed stakeholder ratio was taken rather as a benchmark than an obligatory reference value and was not strongly persisted on.

Acronyms

Acronym	Meaning
AI	Artificial Intelligence
AV	Autonomous Vehicles
D	Deliverable
EC	European Commission
GA	Grant Agreement
ICT	Information and Communication Technology
LF	Load Factor
LSP	Logistics Service Provider
O	Objective
ODD	On-demand Delivery
P	Product
PPP	Public Private Partnership
PM	Person Month
SUMP	Sustainable Urban Mobility Plan
SULP	Sustainable Urban Logistics Plan
T	Task
UC	Use Case
UCC	Urban Consolidation centre
UFT	Urban Freight Transport
ULaDS	Urban Logistics as an on-Demand Service
WBS	Work Breakdown Structure
WP	Work Package
VUR	Vehicle Utilisation Rate
ZEV	Zero Emission Vehicle

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